

# SMALL FINDS CONSERVATOR IN SIDON, LEBANON (2) BRONZE CORROSION. IF IT'S FLUFFY, SLIMY OR SMELLY, IT'S BAD!

July 28, 2017   Philippa Pearce   Conservation   conservation, Lebanon, Sidon

Part of the reason I enjoy coming to work in Sidon is that I did my early training in the old British Museum Department of Western Asiatic Antiquities so many of the finds here are familiar types. Also, I am totally unfazed by massive corrosion. Sidon is a seaport and the soil is both damp and full of salts. Our metals tend to be more mineral samples, really.



2014  
*As excavated*



2014 *After cleaning,  
stabilisation and lacquering*



2017  
*As found in store*



2017 *After removal  
of active corrosion*

*Owl coin from Sidon*

All conservators have the usual chemical remedy they go to for active bronze corrosion: benzotriazole. It was originally used in industry to treat exterior bronze or copper architectural features like metal rooves but it was soon found to be useful in treating corroded antiquities. <https://www.iiconservation.org/node/258> (*A preliminary note on the use of benzotriazole for stabilizing bronze objects.* Authors: Madsen, H. Brinch; Source: *Studies in conservation*, Volume 12, Number 4, p.163-167 (1967))

It pretty well solves 99.9% of bronze problems but, occasionally, you come up against an object and know that good old BTA just isn't going to work. One such item was a coin I cleaned here in 2014. The corrosion was thick with soil deposits bonded into the corrosion with silicates. I managed to get the coin reasonably legible but I knew it had thick waxy deposits of cuprous chloride running under the surface detail. I could not remove the chloride manually without destroying the remaining detail. All I could do was immerse the coin in benzotriazole solution for some days and then give it a protective coat of acrylic. This year I thought I would revisit the coin and check how it was doing. Sometimes it is no fun to be proved right. The poor little coin of Athens was covered in the classic fluffy emerald green crystals of active bronze disease. However, it was only when I began to remove the crystal eruptions that I realised that they had burst through a thin layer of silver foil, as well as the overlying copper corrosion. The coin was a contemporary ancient fake silver coin. A copper alloy coin had been covered in two discs of silver foil like a chocolate coin, the edges burnished round. Our coin expert will have to tweak his coin catalogue a little!

And it's back in the benzotriazole again for the Athenian coin and this time it will get the additional treatment of an application of black silver oxide, an even older method I was taught in the old Department of WAA. The result is not as subtle as BTA as there will be a slight change of colour and texture as the silver bonds with the chloride ions to form a stable "scab" of inert silver chloride, sealing off the potentially active cuprous chloride (...or that is how they taught the chemistry to me in old WAA)

Yesterday on site the archaeologists had been baffled by uncovering dozens of hard white points. Next thing I know, an enormous antler has arrived in my workshop. Another problem I can throw so old trusted chemicals at!